

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problems Mailbox.**

**THIS PAGE BLANK (USPTO)**

# PATENT SPECIFICATION

Convention Date (Germany): May 16, 1934.

449,113

Application Date (In United Kingdom) : May 16, 1935. No. 14341/35.

Complete Specification Accepted: June 22, 1936.



## COMPLETE SPECIFICATION

### Improvements in Apparatus for Sorting and Conveying Letters and the like

We, N. V. TECHNISCHE MAATSCHAPPIJ MARCHAND-ANDRIESEN, of 2, Vondelstraat, The Hague, Holland, a Dutch Company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In sorting and conveying apparatus for letters and similar articles it is desirable that these articles should all pile up in regular stacks at the collecting places with the addressed surfaces (or the surfaces corresponding thereto, if there should be no real address) all facing in the same direction (for instance upwards) and with the addresses all in the same direction, as prescribed for postal matter by the regulations of the Universal Postal Convention, so that the stacks thus formed can be bundled easily without further arrangement or else can readily be further sorted in a subsequent sorting operation if necessary.

For this purpose it is necessary as far as possible to prevent the articles from turning in an undesired manner either in their plane or about an axis lying in their plane during conveying and to ensure that they are repositioned in the desired direction as well as possible should they have been displaced to a greater or lesser extent.

Various means are already known for this purpose.

For instance guiding chutes with a hollow bottom are used for guiding the letters from conveying bands or other conveying means to the collecting places.

These chutes have a certain directing effect, but they can be used only up to a certain inclination and cannot be positioned at a steep slope or almost vertically, because at the high speed of fall light articles are then blown up by the air resistance due to the small resulting pressure on the bottom. The articles thus leave the bottom of the chute, whereby the directing effect is lost. The arrangement in the chutes of speed reducing devices such as flat springs, under which the letters must pass, or flaps as in Austrian Patent No. 125,827, is detrimental to the security of good working due to the danger of obstruction and moreover the conveying capacity is reduced.

Devices are also known e.g., according to British Patent No. 317,147, by which the letters are guided from one conveying band on another, as are other devices, e.g., according to German Patent No. 466,499 by which a paper, projecting laterally from the conveying band, is correctly aligned thereon.

The object of the present invention, is to provide modified and improved means for obtaining good stacking at the collection places in accordance with the above-mentioned regulations.

According to the present invention provision is made of apparatus for conveying and guiding letters and similar articles in sorting, conveying, and combined sorting and conveying apparatus or machines, wherein arranged in the chutes serving as guides are guiding ribs or strips extending in the direction of motion of the letters and of such a cross-section, for instance of barbed hook shape, that the letters can readily enter the path thus formed by which they are guided in their desired (vertical) position and are prevented from turning whereby a regular stacking of the letters at the collecting places is effected with the desired surface upwards and the addresses in the same direction.

A constructional arrangement according to the present invention together with several modifications thereof will now be described with reference to the accompanying drawings in which

Fig. 1 is a front elevational view of a guide chute showing the arrangement of the guide faces which extend longitudinally of the chute.

Fig. 2 is a fragmentary detail view of a modified form of the delivery aperture of the chute.

Fig. 3 shows in part sectional side elevation an operative arrangement of five guide chutes, each constructed as shown in Fig. 1 and associated with appropriate stack receptacles.

Fig. 4 is a transverse section of the

guide chute taken on line IV—IV of Fig. 1 showing in dotted outline the position of a postal packet lying therein.

Fig. 5 is a part sectional detail view drawn to a larger scale and showing a stack receptacle with a stationary bottom and an electrical indication device.

Fig. 6 is a part sectional detail view of a stack receptacle of modified construction.

Fig. 7 shows in part sectional side elevation a further modified construction of stack receptacles, while

Fig. 8 is a part sectional front elevation of the arrangement shown in Fig. 7.

When for example guiding chutes are used for conveying the letters which may be of different dimensions and of different shapes, these guiding chutes, especially the parts *a* which the letters traverse first, are provided with fixed guide ribs *b* and *c*, or alternatively loose and adjustable guide ribs or strips, extending in the direction of motion of the letters as shown in Fig. 1 of the drawing. The drawing shows only one rear guide rib *b* and one front guide rib *c*, but there can be more than one of these ribs or strips if desired. Apart from ensuring that the letters are correctly guided the front guide ribs or strips *c* may also serve the purpose of keeping the letters in the path formed by the rear guide ribs or strips *b*, which is especially important when steeply inclined or vertical chutes are used. When desired the ribs or strips can be arranged in such manner that the proper conducting path formed by them diverges towards the lower end.

In the practical example of the invention described herein the chute is of flattened tubular construction although the walls of the chute are not necessarily contiguous but may have an open seam therein. In cross section the walls and ribs or guide strips of the chute are of such unsymmetrical form, e.g. barbed hook shaped as in Fig. 4, that the letters *n* slide over them easily in one cross direction indicated by arrow *p* while sliding in the other cross direction is hindered by the edge of the letter abutting the ledge *q* formed by the inclined rib *b*. In this way the letters easily enter the predetermined path thus formed between the side *s* of the chute and the ledge *q* of the rib *b*, especially when they are thrown into the chutes in a somewhat oblique direction or when the chutes are positioned obliquely. Owing to the rib *c* the letters cannot readily leave this path so entered and therefore they can slide downwards in the desired (vertical) position as shown

in Fig. 1 without diminishing their speed although they are restrained from turning, whilst at the same time their position is corrected if they should have made already an undesired turn, this restraint and correction being effected by the collision of the vertical sides of the letters with the side walls of the chute and/or with the guide ribs or strips.

When the chutes are wider than necessary for the size of the letters the guide ribs tend to guide the letters to one side of the chutes, i.e. the left-hand side as viewed in Fig. 4 so that the collecting boxes or receptacles can be made narrower than the entire width of the chutes, i.e. no wider than need be to contain the letters which is desirable for enabling a good stacking. It will readily be appreciated that with the chutes inclined as shown in Fig. 3, the letters or packets will naturally become located between the side *s* of the chute and ledge *q* as shown in dotted lines in Fig. 4. Moreover, it will be clear that when two or more ribs *b* are provided these form a number of parallel pathways in which the letters or packets will become located according to their size.

In apparatus with collecting boxes or receptacles having slightly inclined or horizontal bottoms and steeply inclined or vertical chutes, parts *d*, Figs. 1 and 3, of smaller inclination and of known form, e.g. with a concave or hollow bottom *e*, Fig. 2, can be arranged at the lower part of the chutes, to alter the direction of motion of the letters in such a way that they approximate to their horizontal position and pile up regularly in the receptacle, while at the same time they are directed or registered by the collision of their foremost or under edge with the bottom. Due to this collision any letters not already correctly directed are turned slightly about an axis in their plane.

For further promoting regular stacking when boxes or receptacles are used for collecting the letters, guide or deflecting flaps *f* (Figs. 3, 5, 6, 7,) of suitable elastic material can be fixed at the top of these receptacles. These flaps hang downwardly under the action of their own weight and the letters slide along the underside of the flaps. In this manner the letters are guided downwardly at their foremost edge whereby they are more satisfactorily laid flat on the bottom of the receptacle or on top of the stack already formed because their foremost edge collides with this first and furthermore the formation of undesired heaps due to letters arriving aslant in the lower foremost part of the receptacle is

prevented. Moreover their motion is damped partly by these flaps so that they do not rebound or jump much on collision with the front wall of the receptacle, which also assists good stacking.

Moreover when the height of the stack increases, the papers are clamped a little by the weight of the free end of the flap resting on the stack with the same result as mentioned above.

These flaps can readily be provided with an electric contact *h*, Fig. 5, which switches on an alarm device, a lamp, a bell, buzzer or the like, when the stack reaches a certain height to give a warning that the corresponding receptacle must be emptied. Provision is made of hinged doors *g* which constitute the front walls of the receptacles and are retained in the closed position by suitable springs (not shown). To permit the removal of the stacked letters from the receptacles the doors *g* are swung outwards and upwards about their hinges.

In order to have a check for every receptacle or every vertical row of receptacles (Fig. 3) as to whether a receptacle is full so that the letters begin to heap together in the lower part of the chute and no longer enter the receptacle, thus preventing a regular stacking or as to whether a letter has become stuck in the chute with the same result, holes *i* can be arranged in the bottoms of these lower parts (or, when desired, in the upper parts also) of the chutes, as shown in Fig. 1, 2 and 3, in such manner that a lamp *k* placed on the axis of these holes illuminates an indicator such as a little window *m*, when desired by reflexion at a mirror *l*. The rays of light are intercepted by a letter, lying on or disposed in front of a hole.

These optical warning signals, can if desired, be completed by utilising known electrical devices by means of which other warning signals such as above referred to are put into action or the sorting machine stopped, due to interception of the rays of light.

The bottoms of the stack receptacles can be supported by or hung on springs, as shown in Figs. 7 and 8 for instance so that these bottoms move downwardly under the weight of the letters resting on them, and the stack is reached by each letter after a small distance of free fall, this distance being small even for receptacles of large capacity so that the letters are not given the opportunity to wander about the receptacle as is the case in known arrangements where the initial letters of each stack fall through a comparatively big distance. To this end the

bottom member *t* is formed with downward extensions which are slidably mounted upon guides *u* rigidly secured to the stationary side walls of the stack receptacles. Tensile springs *v* anchored at one extremity to the downward extensions of the member *t* serve normally to maintain the latter in the position shown in full lines in Figs. 7 and 8. The weight of the accumulating stack of papers upon the bottom *t* overcomes the force of the springs *v* so that the bottom member eventually assumes the position shown in dotted lines in Fig. 7.

The bottoms can also be hinged for the same purpose, as shown diagrammatically in Fig. 6. As shown in the drawing the pivotal bottom member *w* is hinged at its rear edge to a stationary portion (not shown) of the receptacle box and normally is resiliently held in the position shown in full lines in the drawing by the force of a tensile spring *x*. Under the weight of the papers deposited upon the member *w* the latter eventually assumes the position shown in dotted lines in the drawing.

Electric contacts can be arranged beneath these moving bottoms in order to indicate when the stack has reached a certain height in a similar manner to that described for the flaps *f*.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Apparatus for conveying and guiding letters and similar articles in sorting, conveying, and combined sorting and conveying apparatus or machines, wherein arranged in the chutes serving as guides are guiding ribs or strips extending in the direction of motion of the letters and of such a cross-section, for instance of barbed hook shape, that the letters can readily enter the path thus formed by which they are guided in their desired (vertical) position and are prevented from turning whereby a regular stacking of the letters at the collecting places is effected with the desired surface upwards and the addresses in the same direction.

2. Apparatus as claimed in claim 1, wherein the guiding ribs or strips define alternative paths of travel for the letters according to the size of the latter.

3. Apparatus as claimed in claim 1 or 2, wherein the stack receptacles associated with the chutes for collecting the sorted letters, have arranged at the top thereof a collision or guide flap of suitable elastic material, whereby the letters to be stacked are guided and directed to effect a regular stacking

whilst at the same time the free end of the flap prevents the letters from rebounding too much in the receptacle by diminishing their motion and exerting a clamping action on them.

4. Apparatus as claimed in claim 1, 2 or 3 wherein a ray of light is projected through holes in the guiding chutes to illuminate or otherwise operate an indicator or machine control, the arrangement being such that a letter which is lying on the hole in the chute due to the receptacle being full or for another reason, thus preventing regular stacking, intercepts the ray of light so that the indicator is no longer illuminated and/or is otherwise acted upon and/or the apparatus or associated sorting machine is rendered inoperative.
5. Apparatus as claimed in claim 3 or 4, wherein electric contacts which switch

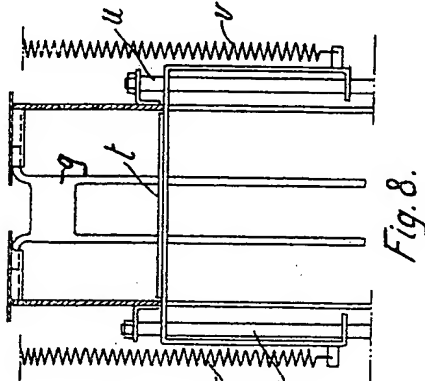
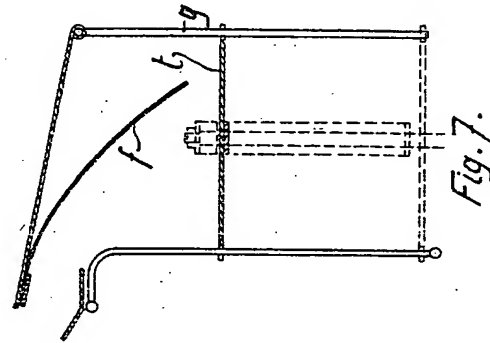
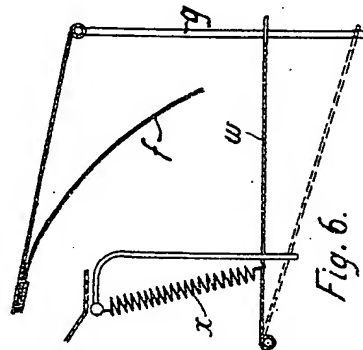
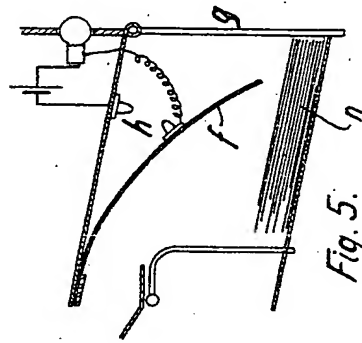
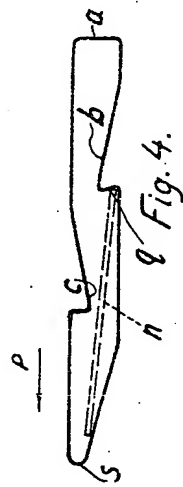
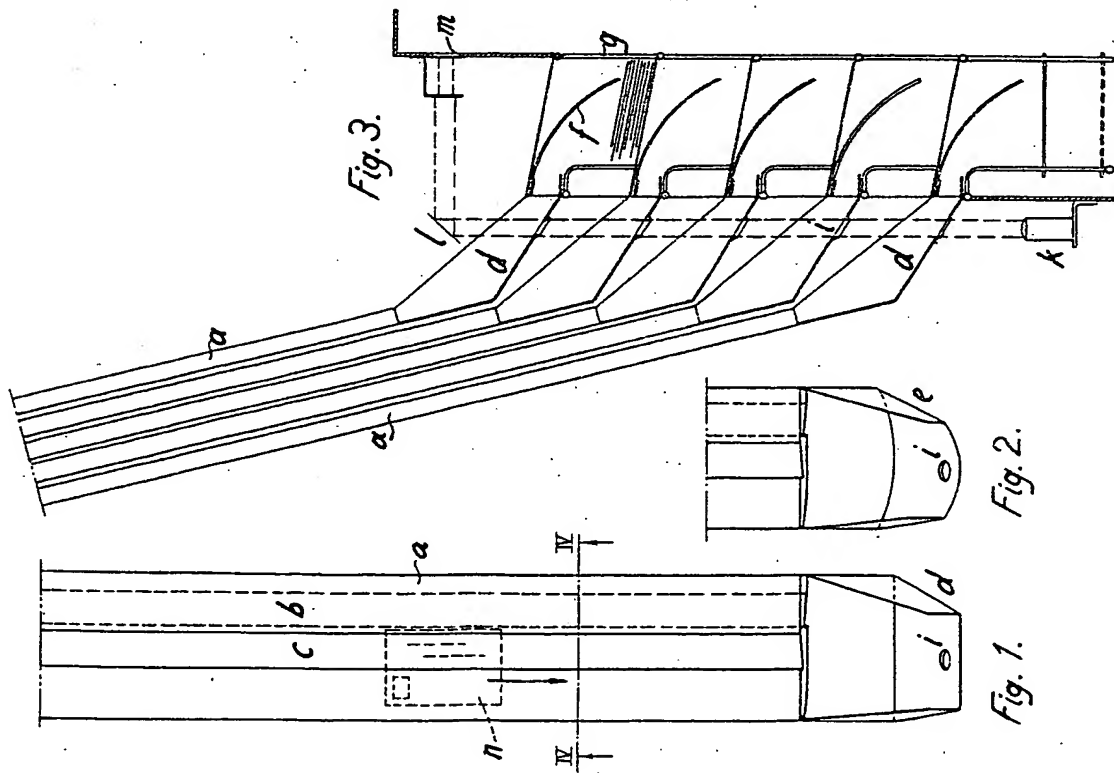
on a light or other signal or stop the machine when a certain height of the stack is reached are provided on or in association with the collision or guiding flaps to give a warning that the corresponding receptacle must be emptied to avoid too high a stack, which would prevent regular stacking.

6. Apparatus for conveying and guiding letters and similar articles in sorting, conveying and combined sorting and conveying apparatus or machines, constructed, arranged and adapted to operate substantially as described, with reference to the accompanying drawings.

Dated this 16th day of May, 1935.

DICKER, POLLAK, MERCER,  
TENCH & MEYER,

Chartered Patent Agents,  
20 to 23, Holborn, London, E.C.1,  
Agents for the Applicants.



[This Drawing is a reproduction of the Original on a reduced scale.]

**THIS PAGE BLANK (USPTO)**